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ABSTRACT

The relationship between the realization of the argument-structure of a verb and its acquisition as a lexical item was investigated in a case study. The subject was a girl aged 2.3 years whose father was a native English-speaker and whose mother was a native Japanese speaker who also spoke English. The child had been born in the United States but had just moved to Japan and begun to speak Japanese. The language corpus used was recorded in the girl's home. English verb acquisition was examined. Analysis of the corpus suggests that children drop arguments of verbs in the course of acquiring argument-structure, and that they notice the obligatory nature of a phrase bearing a certain semantic role. It is concluded that children can solve the problem by indirect negative evidence, which is assumed to be necessary only for the acquisition of a special class of verbs. Further, it is shown that children do not examine the obligatory nature of all phrases, but only those that do not conform to a particular construction, which the children are able to set up in order to acquire verbal argument-structure easily. A brief list of references is included. (MSE)

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ACQUISITION OF THE ARGUMENT-STRUCTURE OF VERBS *

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1. Introduction

With a decrease in the descriptive power of the categorial component within the principles-and-parameters approach, the role of the lexicon has become all the more important; the information about the argument-structure, or the θ -grid should be included in the appropriate definition of lexical entry in order to have the projection principle and the θ -criterion function properly. Independent of general linguistic theory, a problem such as "How do children recognize the correspondence between syntactic structure and semantic structure?", or "How do they add new lexical entries to the lexicon?" is intriguing in the study of grammatical development. The aim of this paper is to explore the acquisition of the argument-structure of verbs in the early stage, mainly based upon the data I collected using a naturalistic-longitudinal approach.

The organization of this paper is as follows. In section 2, I will survey adult grammar (i.e. the target grammar) to clarify the problems dealt with in this paper. Section 3 will present the observation of what actually happens in the process of acquisition. In section 4, I will discuss the problems raised in section 2.

2. Target Grammar

First of all, let us consider the following sentences.

- (1)a. Mary slept.
b. *Mary slept Lucy.
- (2)a. *Mary hit.
b. Mary hit Lucy.

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According to the principles-and-parameters approach, these contrasts can be explained by the θ -Criterion stated in (3).

- (3) Each argument bears one and only one θ -role, and each θ -role is assigned to one and only one argument. (Chomsky 1981: 36)

(1b) is a violation of the former part of (3): *Lucy* has no θ -role assigned to it, because the verb *slept* has a θ -role to assign to a subject but it has no θ -role to assign to an object. (2a) is a violation of the latter part of (3): the verb *hit* has two θ -roles (i.e. one to assign to a subject and the other to an object) but it has only one argument in (2a).

Now let us consider what children should acquire in order to use such sentences as (1a) and (2b) correctly. We can assume at least two things:

(i) the association between the phonological properties of each verb and its meaning including the property of the θ -role, (ii) the correspondence between the θ -role which each verb has and its syntactically realized form. To be concrete, if a child comes to know that a verb pronounced *hit* is one which refers to both AGENT (i.e. hitter) and PATIENT (i.e. hittee), and that both of them are realized as NPs, (s)he can use (2b) correctly.

In this paper I will concentrate upon correspondence (ii). Half of this section will be devoted to the description of discrepancy between the syntactic structure and the semantic structure. To begin with, I will consider two-place-predicate verbs, quoting examples from Huddleston (1984):

- (4)a. Ed was writing a letter.
- a'. Ed is washing himself.
- b. Tom hit Bill.

All the verbs used in (4) appear in the same syntactic configuration [NP__NP]. However, all of them cannot occur in [NP__]:

- (5)a. Ed was writing.
- a'. Ed is washing.
- b. *Tom hit.

Comparing (4a-b) with (5a-b), we can see that verbs such as *write* and *wash* allow an implicit argument while a verb like *hit* does not: (5a) means "Ed was writing something." and (5a') can be interpreted as "Ed is washing himself" (=4a') or as "Ed is washing the clothes", while (5b) cannot be interpreted as "Tom hit something" nor as "Tom hit himself". The verb *hit* must take an NP object. We will assume that a verb which takes an implicit argument has the subcategorizational frame [__(NP)], and that a verb which does not take an implicit argument has [__NP].

What we have observed so far shows that the understood object can be an implicit argument. At this point, we are faced with the following problem: "How do children recognize that some verbs allow an implicit argument and that others do not?"

Before we deal with this problem, let us consider the argument-structure of three-place-predicate verbs in addition to (4) and (5). First, look at the following sentences:

- (6)a. Bill put the book on the table.
- b. *Bill put.
- c. *Bill put the book.
- d. *Bill put on the table.

The verb *put* has three arguments. We will refer to them as AGENT, THEME, and LOCATION (henceforward LOC). These are realized as NP, NP and PP respectively. THEME and LOC correspond to the post-verbal NP and PP. Neither of them can be an implicit argument: (6c) cannot be interpreted

as "Bill put the book somewhere" nor does (8d) mean that "Bill put something on the table". The representation of the lexical entry of *put* is as follows (our attention is paid only to the post-verbal position hereafter):

(7) put : <THEME, LOC> [___NP, PP]

Secondly, consider the following sentences:

- (8)a. He gave the girl a doll.
- b. *He gave.
- c. *He gave the girl.
- d. He gave a doll.

The verb *give* is also a three-place-predicate. Two NPs follow the verb: one bears the semantic role of THEME and the other bears the POSSESSOR (henceforward POSS) role. Unlike the verb *put*, both of them are not necessarily obligatory: while (8c) cannot be interpreted as "He gave the girl something", (8d) means "He gave a doll to somebody". Although the verb *give* usually takes two NPs in the post-verbal position, only indirect object can be an implicit argument (Quirk and Greenbaum 1973: 370). The representation of the lexical entry of *give* is shown in (9):

(9) give: <POSS, THEME> [___(NP1) NP2]

Here again, we are faced with the same problem as the one mentioned above: "How do children find which verb takes an implicit argument?" In addition, a new problem arises: "Which semantic role can be an implicit argument?" or "Which phrase must be present for the proper realization of the argument structure of a verb?"

In the following section, I will look into the data to see what happens in the process of acquisition, before trying to answer the questions presented in this section.

3. Acquisition of the Argument-Structure of Verbs

The overall aim of this section is to observe the facts concerning the relationship between the realization of the argument-structure of a verb and the acquisition of a verb as a lexical item, based upon a corpus I made following Wells' approach (1985).¹ In section 3.1 some relevant properties of the corpus will be mentioned briefly. In section 3.2. the observational facts connected with the problem stated above will be given.

3.1. Data

I collected spontaneous utterances of a girl from December 1987 to September 1988, from the age of 2;3 to 3;1. The girl, who is called Megumi (henceforth Meg) was born in New York on July 30, 1985. Her father is an American and his native language is English. Her mother is a

Japanese and she speaks both Japanese, as her native language, and English. When Meg was one year old, she moved to California with her parents. When she was 1;6, her sister was born. When Meg was 2;2, she came to Japan with her family. Meg's parents were speaking to her only in English when they were in the U.S.A. After coming to Japan, although her mother began to use Japanese depending on the situation, her parents usually spoke English.

It was when Meg was 2;3 that I met her for the first time. Up until that time she had not spoken Japanese. Gradually she began to speak Japanese. At this early stage, she used both English and Japanese words within a single sentence, but she did not utter sentences which contained only Japanese words. Although the comparison of the acquisition of English with that of Japanese or the interaction between them is a very interesting topic of study,² we will not pursue this matter here. In this paper we will concentrate on the acquisition of English only.

The corpus we use in this paper is drawn from conversations in which Meg, her parents, her sister and I took part. I visited Meg's house at least every two weeks (mostly once a week) and recorded her speech for one and half an hours on each occasion. A small-sized tape recorder was used and care was taken to keep it unnoticed by the child in order to avoid creating an unnatural factor.

In the following sections we will investigate the acquisition of the argument-structure of verbs based on the corpus mentioned above. We will also look into Wells' corpus (1985) to examine whether what is true of Meg is also true of monolingual children.

3.2. Observational Facts

In this section, I will deal with the problem pointed out in section 2 in the following way. First I will briefly comment on Meg's grammatical development. Secondly, I will classify the verbs used by Meg based upon the syntactic configuration in which the verb occurs. Thirdly, I will present a close investigation of some particular verbs.

The majority of Meg's utterances from the age of 2;3 to 3;1 are simple sentences. Embedded sentences rarely appear although the verb *want*, which is followed by an embedded sentence without its subject, is productively used (e.g. "I want to go downstairs" (2;7)).³ Focusing our attention on the simple sentences, we classify the verbs used by Meg based on the syntactic configuration in which the verb appears. (See Table 1.)

Let us now state the general phenomena in Meg's acquisition of the argument-structure of verbs before going on to a closer investigation of some particular verbs. As is shown in Table 1, the major class of verbs used by Meg is monotransitive. The argument-structure of those verbs is properly realized from the beginning. As for pure intransitive verbs which do not take an implicit argument in the post-verbal position (e.g. *come*, *sleep*, *cry*, *talk*, *walk*, etc), no subcategorizational mistakes are found in the corpus. As one of the relevant examples, I will cite all utterances which contain the verb *come* from the corpus:

Table 1. First Appearance of Each Verb in the Corpus

- <1> The vertical column shows Meg's age.
 <2> The horizontal column shows the classification of verbs.⁴
 A. Intransitive ; I sleep / I go [PP to school]
 B. Monotransitive ; I have [NP a book]
 C. Ditransitive ; I give [NP you] [NP a book]
 D. Complex Transitive ; I put [NP the book] [PP on the desk]
 <3> ~~Verb~~ : A verb which can occur in A and B in adult grammar.
 <4> *: Incorrect use in adult grammar.
 <5> ?: It is questionable whether the verb is properly used or not.

	A [___][__(PP)]	B [___NP]	C [___NP NP]	D [___NP PP]
2;3 2;5	come sleep go look ~~read~~ sit	~~eat~~ like take find ~~open~~ touch get play want have ~~read~~ wear hold remember	ask	*put
2;6 2;7	cry talk ~~drink~~ ~~write~~	bite lost show cut make sing do need ~~wash~~ ~~drink~~ see ~~write~~	give gave show	put
2;8 2;9	walk ~~wash~~ fall pick	bring help broken love brought try	---	---
2;10 2;11	?move ~~?break~~ swim happen *stand ~~study~~	~~break~~ lose buy tear	---	---
3;0 3;1	dance laugh stay	catch kill hit kiss	---	---

- | | |
|------------------------------|-------|
| (10)a. You come in. | (2;3) |
| b. Can you come? | (2;7) |
| c. Come here, see. | (2;9) |
| d. See, Gloria's coming. | (2;9) |
| e. And Gloria come to there. | (3;1) |
| f. Mika, Mika, come here. | (3;1) |

Generally speaking, both the monotransitive verbs and the pure intransitive verbs are productively used in the proper subcategorizational frame from the beginning. Let us here refer to one curious utterance which does not violate this generalization but falls into the group of examples of improper use of a verb.

- | | |
|----------------------|--------|
| (11) We can't stand. | (2;10) |
|----------------------|--------|

Apparently this sample causes no problem. Judging from the situation in which Meg utters this sentence, however, the meaning of it should be understood as "We can't make the doll stand up". Then, how can we explain this? One might say that Meg simply omits some of the words in the sentence, that is, *make, the, doll, up*, because of her immature processing ability. This explanation, however, seems to be wrong, if we take it into consideration that she can speak a seven-word-long sentence (e.g. "I go to bed with my father" (2;7)). Rather we can say that she uses the verb *stand* as a causative verb without knowing that it always takes an object. Even when she is 3;1, she uses a real causative verb *break* without its object (i.e. "I break").

Concerning causative verbs, one more thing can be said. There are few verbs which can be ergative among the verbs used by Meg: *open, break, move*. Actually *open* is used only as a causative verb:

- | | |
|--------------------------------|-------|
| (12)a. Can you open it for me? | (2;3) |
| b. She open it. | (2;4) |
| c. Can you open it? | (2;4) |
| d. I wanna open the door. | (2;5) |
| e. Can you open there? | (2;5) |

The other two verbs are also used as causative verbs except the questionable samples like "Something breaking." (2;10) or "See, something ah, moving among" (2;10). Unfortunately we do not know what the referent of *something* is, so we cannot tell whether *something* can be really interpreted as "patient", or the object of a causative verb is simply omitted. In any case, the number of those verbs that can be causative or ergative is small in the early stage of (at least Meg's) verb acquisition. Although we could discuss this phenomenon along the line of the 'maturation of A-chain' (Borer & Wexler 1987), we had better await further empirical studies. Let us stop here by simply pointing out the fact that we can find only a few causative verbs or ergative verbs, in the early stage of Meg's verb acquisition.

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In the following sub-sections, I will investigate the following three classes of verbs: (i) monotransitive (two-place-predicate) verbs which can take an implicit argument, (ii) ditransitive (three-place-predicate) verbs, some of which can take an implicit argument (e.g. *give*), and (iii) complex transitive (three-place-predicate) verbs which cannot take any implicit arguments.

3.2.1. Two-place-predicate Verbs

In this section I will consider two-place-predicate verbs which can take an implicit argument; *eat*, *read*, *drink*, *wash*, *write*, *study*. As we have observed in section 2, each of them can be used both as an intransitive verb and as a monotransitive verb in adult grammar. As for *read*, *drink*, *wash*, *write*, Meg properly uses them in both ways from the beginning:

- | | |
|---|--------|
| (13)a. Can you read? | (2;5) |
| b. We reading book. | (2;5) |
| c. I want you read this book. | (2;6) |
| d. I read everything. | (2;6) |
| e. Read this one, Mika. | (2;6) |
| f. Daddy read[red] it. | (2;7) |
| g. And mask when you can read a book. | (2;7) |
| h. Mommy read[ri:d] this yesterday. | (2;8) |
| i. Reading, um book, little book. | (2;9) |
| j. Please read it. | (2;9) |
| k. I can read by myself. | (2;10) |
| l. I want to read something, another one. | (3;1) |
| m. Now let's read um, do you have lots of book? | (3;1) |
| (14)a. Mika, you can't drink medicine. | (2;6) |
| b. Yeah, you can't drink. | (2;6) |
| (15)a. I hope to wash my hand. | (2;6) |
| b. Washing hands. | (2;9) |
| c. He washing, washing, washing. | (2;9) |
| d. Washing his face. | (2;10) |
| (16)a. Can you write again Megumi? | (2;6) |
| b. I write. (=I can draw pictures by myself.) | (2;6) |
| c. I didn't write. | (2;7) |
| d. Write a letter. | (2;8) |
| e. Don't write on the wall, no. | (2;9) |
| f. I want to write. | (2;10) |

As for *eat* and *study*, they are also used properly although the configuration in which the verbs occur is always the same: *eat* always appears with its object NP and *study* is used without its object consistently. From what we have observed here, it can be said that the two-place-predicate verb which takes an implicit argument is acquired from a relatively early stage.

3.2.2. Three-place-predicate Verbs

3.2.2.1. Ditransitive Verbs

As for those verbs which can be used as ditransitives in adult grammar, all the verbs in the corpus are *ask*, *give*, *gave*, *show*, *bring*, *brought*, *buy*, *bought* and *tell*. Among them, however, those verbs which were actually used as ditransitives are restricted to the following: *ask*, *give*, *gave* and *show*. *Give* or *gave* appears most frequently. We cannot say that *ask* is productively used as a ditransitive verb since it appears only once in the corpus. The verb *show* is used as a ditransitive as well as a monotransitive verb:

- | | |
|--|-------|
| (17)a. I want to show it mommy. | (2;6) |
| b. I want to show my a lot of book. | (2;6) |
| c. I want to show you books. | (2;6) |
| d. Do you show my little chair? | (2;8) |
| (=Do you want me to show my little chair?) | |
| e. I show my rabbit. | (2;8) |

In addition, *buy* is always used as a monotransitive verb (e.g. "I want to buy ice cream" (3;1)).

One thing should be mentioned here. All the verbs concerned here can occur in both of the frames [__NP1 NP2] and [__NP2 Prep. NP1] in adult grammar. In our corpus, however, they do not appear in the latter frame. It can be said that dative verbs are acquired in the former subcategorizational frame earlier than in the latter one, although the former one is often referred to as a derived structure after the application of the dative alternation.

We will now present a further account of *give* or *gave*, which is used by Meg most frequently among the ditransitive verbs. A collection of Meg's utterances is shown in (18) with representations of semantic and syntactic properties (* indicates an empty place in the subcategorizational frame):

- | | | | <POSS THEME> |
|---|--------|-------------|--------------|
| (18)a. I wanna give it, again. | (2;6) | [__ * NP] | |
| b. Daddy gave me present. | (2;7) | [__ NP NP] | |
| c. I gave another fish, OK? | (2;9) | [__ * NP] | |
| d. Give pillow. | (2;10) | [__ * NP] | |
| e. Give me a shave(=shaver). | (2;11) | [__ NP NP] | |
| f. She's giving <i>osukuri</i> (= <i>okusuri</i>). | (2;11) | [__ * NP] | |
| g. Give your Sesame Street book. | (3;1) | [__ * NP] | |
| h. I will give you <i>ohana</i> . | (3;1) | [__ NP NP] | |
| i. I will give you, I will give you. | (3;1) | [__ NP *] | |

We cannot find any full NPs which bear the semantic role of POSS. NP1 (i.e. indirect objects) are easily realized as pronouns. Concerning this phenomenon, deVilliers and deVilliers(1985:94) points out that young

children tend to treat dative verbs with particular pronominal indirect objects as frozen forms. "Give me[gimi:]" is one of the typical forms. It is true that Meg uses a pronoun when she expresses an indirect object, but she seems not to treat the verb *give* and its indirect object as one unanalyzable form. She uses not only the present form of *give* but also the past form *gave* from a relatively early stage (See 18b). Further, she uses the pronoun *you* as well as *me*.

It can be said that Meg knows that the verb *give* or *gave* takes POSS and THEME as arguments from a relatively early stage (See 18b). We cannot tell, however, whether she knows that POSS can be an implicit argument while THEME cannot. How do children come to realize that NP2 is obligatory while NP1 is optional? Further how should this problem be dealt with in the total picture of the acquisition of verbs? Before we deal with this problem, we will observe the acquisition of one more verb.

3.2.2.2. Complex Transitive Verbs

In this section we will consider a complex transitive verb. Although in our corpus only *put* falls within this class, as is shown in Table 1, the study of this verb makes us notice an important aspect of the acquisition. The first sentence which contains *put* appears when Meg is 2;5. The relevant samples are shown in (19) with representations of semantic and syntactic properties * :

			<THEME	LOC>
(19)a.	Can you put the book?	(2;5)	[__ NP	*]
b.	You can put this.	(2;7)	[__ NP	*]
c.	Can you put birdie?	(2;7)	[__ NP	*]
d.	No, put it there.	(2;7)	[__ NP	PP]
e.	Can I put this?	(2;8)	[__ NP	*]
f.	Don't put this one, OK?	(2;9)	[__ NP	*]
g.	Kuma-chan sick and I put it down.			
		(2;10)	[__ NP	PP]
cf.	Put more, put more. (=Give him more medicine.)	(3;0)		

In comparison with the adult lexical entry of *put* shown in (7), Meg seems to drop the obligatory phrases freely, especially PPs bearing LOC. Even when a LOC phrase appears, it always takes the form of a single word such as *there* or *down* (See 19d,g). At this point, one might suspect that Meg does not use full locative prepositional phrases at this stage, but this is not the case because such phrases have already begun to appear in several different contexts since Meg was 2;6. Some examples are shown in (20).

(20)a.	I have a red <i>on the</i> basket.	(2;6)
b.	Sleeping <i>in a</i> towel.	(2;6)
c.	A Gloria is <i>in a</i> basket.	(2;7)
d.	Don't write <i>on the</i> wall, no.	(2;9)

Now it can be said that the reason she drops PPs bearing LOC is not because she does not know how to express locational meanings. Moreover, her processing ability does not matter either, for the same reasons stated in 3.2. Then how can we explain what we have observed? Before we try to answer this question, let us refer to Wells' corpus.

We would like to mention three children here. To begin with, let us consider a girl called Elspeth. A collection of all her utterances which contain *put* is as follows:

- | | |
|---|-------|
| (21)a. Shall I put it on your finger? | (2;8) |
| b. Shall I put it on my fingers? | (2;8) |
| c. Shall I put it on your finger George(v)? | (2;8) |
| d. I will put that one. | (3;0) |
| e. Pussycat put any faster (laughs) | (3;0) |
| f. I put him on the path. | (3;3) |
| g. Shall I put the caterpillar on the path. | (3;3) |
| h. Why - why you want to put your sock back on? | (3;3) |
| i. - take it - the put the box down. | (3;6) |

Although we cannot precisely say what was happening right before or right after 3;0 because the recording interval of the corpus is three months, we can presume that she drops an obligatory phrase of *put* around 3;0.

Judging from the data of the two children including Meg, we might be tempted to say that only a LOC phrase can be optional in children's grammar. Further investigation, however, indicates the possibility of dropping an NP bearing the semantic role of THEME. Some of the examples are shown in (22).

- | | |
|--------------------------------|----------------|
| (22)a. Put round there. | (Jonathan 3;0) |
| b. Me put in a - in a <table>. | (Iris 3;3) |

Here we should say one more thing. It is true that both Jonathan and Iris drop not only a LOC phrase but also a THEME phrase, but the frequency of the latter case is lower. Although there may be reasons for this, we will put it aside for the time being.

Now let us consider how we can interpret the phenomena shown in (19) and (21). One thing we can assume is that children do not know which phrases are obligatory ones although they can deduce from the meaning of each verb the number and the kind of the arguments they can take. To be more concrete, children know that either a THEME phrase or a LOC phrase can follow the verb *put*, but they do not know that both of them are obligatory phrases. Speaking of Meg, she regards a LOC phrase as optional at least during the period mentioned in (19). Here we have a question: how do children recognize that these phrases are obligatory?

4. Discussion

In the preceding sections, we have observed that children undergo a

period in which they drop the arguments of certain verbs; in other words, they seem to regard obligatory phrases for a verb in adult grammar as optional ones at a certain stage of acquisition. Then how do children shift to the very knowledge that adults have? In this section we will deal with this problem.

Before starting our discussion, it is necessary to remember what we have observed in 3.2. First, the major class of verbs used by Meg is monotransitive. Secondly, we can hardly find mistakes in the subcategorization of the monotransitive and the intransitive verbs. In these respects, it can be said that the monotransitive verbs and the intransitive verbs (although the number of them is smaller) are used correctly and steadily from a relatively early stage of the acquisition of verbs. In the same stage, however, the classes of verbs that we have investigated in 3.2.2 is still unstable. Based on these observations, we will assume that before children start to use such verbs as *put* and *give*, the two molds shown in (23) * are established connected with the argument-structure of intransitive verbs and monotransitive verbs:

- (23)a. NP(AGENT) - V
- b. NP(AGENT) - V - NP(THEME/PATIENT)

Once these two molds are set up, children begin to learn many of the intransitive verbs and the monotransitive verbs efficiently.

We will now start our discussion. To begin with, we will consider the role of 'experience'. Following Chomsky (1981), we will refer to three types of evidence that can (or may) be used in the process of the acquisition of grammar:

- (24)a. Positive evidence
- b. Direct negative evidence
- c. Indirect negative evidence

Let us now consider the problem mentioned above in the light of (24). First, the positive evidence is available to children in the following way: they hear sentences spoken by adults around them, and they come to notice that *put* can take THEME and LOC as its arguments, or that *give* can take POSS and THEME as its arguments, although they are unaware of the notion of obligatoriness at this stage. Because of this unawareness, they sometimes drop obligatory phrases for a verb and cannot realize the proper argument-structure. Now we have to recall the tendency which we have noticed in the 3.2.2, that is, a phrase bearing the semantic role of THEME hardly drops. If children are unaware of the obligatoriness of any phrases, how is this tendency explained? For the purpose of dealing with this problem, consider the following sentences:

- (25)a. You have candies in your pocket.
- b. You put candies in your pocket.

In adult grammar the difference between the two verbs *have* and *put* is the obligatoriness of the prepositional phrase bearing LOC.

- (26)a. You have candies.
- b. *You put candies.

As for children, it is possible that they regard both *have* and *put* as monotransitive verbs, partly because both of the verbs can occur in the same configuration as is shown in (25), and partly because it is not certain that they would be given the direct negative evidence concerning the ill-formedness of (26b).⁷ Moreover, just as they think of "in your pocket" in (25a) as something additional, because the prepositional phrase in question is not analyzable with (23b), so they regard "in your pocket" in (25b) as something additional when they encounter the sentence. If a child classifies *put* into the group of monotransitive verbs in this way, (s)he may sometimes drop a phrase bearing the semantic role of LOC, but does not drop a THEME phrase. To sum up what we have discussed so far, the fact that a phrase bearing THEME hardly drops and that a LOC phrase easily drops is attributed to (23b); children are still unaware of the obligatoriness of a certain phrase. Then how do children leave this stage?

Children who classify *put* into the group of monotransitive verbs based on (23b) gradually come to know that *put* is different from the other monotransitive verbs in the following point: while *put* (almost) always co-occurs with a LOC phrase, the others sometimes co-occur with a LOC phrase and sometimes do not. Then they conclude that *put* is a special monotransitive verb that always co-occurs with a LOC phrase. It is at this stage that children become sensitive to the obligatoriness of LOC. Until this stage, children just search for those verbs that are consistent with (23), and realize the syntactic structure of a sentence simply based on (23).

We would like now to consider the children mentioned in 3.2.2.2 once again. To begin with, let us take up the case of Meg (See 19). It can be said that she still stays at the first stage: she regards *put* as a monotransitive verb based on (23), and phrases bearing LOC which occur in (19) have the same status as the prepositional phrase shown in (24a) has. Secondly, as for the case of Elspeth (See 21), it may be said that she regards *put* as a monotransitive verb at least until 3;0 and that the shift to the adult lexical entry of *put* takes place during the age of 3;0-3;3. Our observation shows that only a LOC phrase that appears after 3;3 is treated as obligatory (See 21f-i).

So far we have shown that the acquisition of the argument-structure of *put* is a special case of that of monotransitive verbs. In other words, the argument-structure of each verb is generally acquired by means of the molds shown in (23), at least before the appearance of embedded subordinate clauses. It is only when they acquire the argument-structure of such a verb as *put* that children rely on indirect negative evidence concerning an obligatory phrase, besides (23).

Let us now consider the acquisition of ditransitive verbs. In 3.2.2.1 we observed apparently the same phenomena as in the case of *put*, that is, dropping an obligatory phrase. Then we are tempted to explain the phenomena or solve their problem, by using the same mechanism as stated above. If we consider the relatively large number of ditransitive verbs, however, we are uncertain whether we can use the mechanism for a minor class of verbs such as *put*, in order to explain the acquisition of a major class of verbs. It seems rather reasonable to suppose that there is another independent mechanism for the acquisition of ditransitive verbs, and that what we have observed in 3.2.2.1 should be dealt with within that mechanism. Before starting to search for a new mechanism, however, we should examine whether our observation is also true with monolingual children.

5. Conclusion

In this paper we have studied the acquisition of the argument-structure of verbs based upon the data collected in a longitudinal way. What we have discovered is that children drop arguments of verbs in the course of acquiring argument-structure. What we have discussed is how children notice the obligatoriness of a phrase bearing a certain semantic role. We have now come to know that children can solve the problem by means of indirect negative evidence, which is assumed to be necessary only for the acquisition of a special class of verbs such as *put*.

Further we have shown that children do not examine the obligatoriness of all phrases. To be more precise, they have to be sensitive only to the obligatoriness of phrases outside the mold shown in (23). Children do not have to explore all the possibilities by means of molds such as (23). It seems reasonable to assume that children have an innate ability to set up a limited number of molds, in order to acquire the argument-structure of verbs efficiently. One of the next tasks for us is to make this idea much clearer.

NOTES

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1. This corpus is in the appendix of Endo(1988).
2. Although we cannot deal with this topic in the text, Imanishi(1987-88) enlightens us about the various aspects of a bilingual child.
3. Subordinate clauses have also begun to be used. *Because*-clauses appear in our corpus when Meg is 2;5 and she begins to use them productively from 2;8. In addition, *When*-clauses (used as time adverbials) appear at 2;7. It is when Meg is 3;1 that we can first find *If*-clauses.
4. I adopt the classification by Quirk et al. (1985: 1171)
5. In this paper, I refer to not only a prepositional phrase such as *on the table* but also adverbial phrases like *there* and *down* as a PP.
- 6(a). The pair of molds shown in (23) indicates that children do not get confused between the two. In other words, children can distinguish between the intransitive verb and the monotransitive verb from an early stage. This claim is supported by the experimental results of Gleitman et al. (1987).
- (b). These two molds are constructed by means of the notions which are given to children innately. We owe this idea to Pinker (1984, 1987): 'semantic bootstrapping', 'linking rules' etc.
7. As for 'negative evidence', its effect seems to still be a controversial matter. It is generally agreed, however, that the significance of negative evidence should be reduced as much as possible (Pinker 1987). In this paper we take the position that indirect negative evidence can be available to children while direct negative evidence is not reliable.

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